Apprenticeship and Industry Training

Parts Technician

Apprenticeship Course Outline

2713 (2013)

Alberta

Apprenticeship and Industry Training

ALBERTA ENTERPRISE AND ADVANCED EDUCATION

Parts Technician apprenticeship course outline

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Course Outline

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Apprenticeship

Apprenticeship is post-secondary education with a difference. Apprenticeship begins with finding an employer. Employers hire apprentices, pay their wages and provide on-the-job training and work experience. Approximately 80 per cent of an apprentice's time is spent on the job under the supervision of a certified journeyperson or qualified tradesperson. The other 20 per cent involves technical training provided at, or through, a post-secondary institution – usually a college or technical institute.

To become certified journeypersons, apprentices must learn theory and skills, and they must pass examinations. Requirements for certification—including the content and delivery of technical training—are developed and updated by the Alberta Apprenticeship and Industry Training Board on the recommendation of Parts Technician Provincial Apprenticeship Committee.

The graduate of the Parts Technician Apprenticeship Program is a certified journeyperson who will be able to:

- demonstrate a comprehensive knowledge and understanding of the printed catalogue as well as the electronic systems and methods used in the identification, location, and supplying of parts and assemblies to repair shops and individuals
- understand the actions and interactions and know the characteristics of the skills and knowledge required to co-ordinate and determine the most favourable behaviour of parts and material inventories maintained by dealers, jobbers and other types of outlets
- relate to the work of other trades associated with the Parts Technician industry
- be knowledgeable in all aspects of the proper procedural methods for the safe handling and warehousing of all classes of parts and materials
- demonstrate the accurate, prompt identification and application of parts and assemblies required to maintain the serviceable condition of pleasure, commercial, industrial and agricultural vehicles and machines
- demonstrate the productive application of skills and knowledge necessary to initiate and develop effective communication with the intelligent use of the telephone, facsimile, memos and have an adequate understanding of electronic and computerized equipment in the present day parts business
- demonstrate the ability to recognize and develop situations which are particularly relevant to customer satisfaction, human relations and product promotion
- cultivate an attitude or work ethic which will encourage the practice of good interpersonal skills and honesty
- maintain a standard of professionalism suitable to the position of responsibility held by the Parts Technician
- adapt and develop ability to move with confidence between sectors of the trade
- to assess problems and provide corrective measures as they occur
- perform assigned tasks in accordance with quality and production standards required by industry

Apprenticeship and Industry Training System

Industry-Driven

Alberta's apprenticeship and industry training system is an industry-driven system that ensures a highly skilled, internationally competitive workforce in more than 50 designated trades and occupations. This workforce supports the economic progress of Alberta and its competitive role in the global market. Industry (employers and employees) establishes training and certification standards and provides direction to the system through an industry committee network and the Alberta apprenticeship and industry training board. The Alberta government provides the legislative framework and administrative support for the apprenticeship and industry training system.

Alberta Apprenticeship and Industry Training Board

The Alberta Apprenticeship and Industry Training Board provides a leadership role in developing Alberta's highly skilled and trained workforce. The board's primary responsibility is to establish the standards and requirements for training and certification in programs under the apprenticeship and industry training act. The board also provides advice to the Minister of Advanced Education on the needs of Alberta's labour market for skilled and trained workers, and the designation of trades and occupations.

The thirteen-member board consists of a chair, eight members representing trades and four members representing other industries. There are equal numbers of employer and employee representatives.

Industry Committee Network

Alberta's Apprenticeship and Industry Training System relies on a network of industry committees, including local and provincial apprenticeship committees in the designated trades, and occupational committees in the designated occupations. The network also includes other committees such as provisional committees that are established before the designation of a new trade or occupation comes into effect. All trade committees are composed of equal numbers of employer and employee representatives. The industry committee network is the foundation of Alberta's apprenticeship and industry training system.

Local Apprenticeship Committees (LAC)

Wherever there is activity in a trade, the board can set up a local apprenticeship committee. The board appoints equal numbers of employee and employer representatives for terms of up to three years. The committee appoints a member as presiding officer. Local apprenticeship committees:

- monitor apprenticeship programs and the progress of apprentices in their trade, at the local level
- make recommendations to their trade's Provincial Apprenticeship Committee (PAC) about apprenticeship and certification in their trade
- promote apprenticeship programs and training and the pursuit of careers in their trade
- make recommendations to the board about the appointment of members to their trade's PAC
- help settle certain kinds of disagreements between apprentices and their employers
- carry out functions assigned by their trade's PAC or the board

Provincial Apprenticeship Committees (PAC)

The board establishes a provincial apprenticeship committee for each trade. It appoints an equal number of employer and employee representatives, and, on the PAC's recommendation, a presiding officer - each for a maximum of two terms of up to three years. Most PACs have nine members but can have as many as twenty-one. Provincial apprenticeship committees:

- Make recommendations to the board about:
    - Standards and requirements for training and certification in their trade
    - Courses and examinations in their trade
    - Apprenticeship and certification
    - Designation of trades and occupations
    - Regulations and orders under the apprenticeship and industry training act
- Monitor the activities of local apprenticeship committees in their trade
- Determine whether training of various kinds is equivalent to training provided in an apprenticeship program in their trade
- Promote apprenticeship programs and training and the pursuit of careers in their trade
- Consult with other committees under the apprenticeship and industry training act about apprenticeship programs, training and certification and facilitate cooperation between different trades and occupations
- Consult with organizations, associations and people who have an interest in their trade and with employers and employees in their trade
- May participate in resolving certain disagreements between employers and employees
- Carry out functions assigned by the board

Parts Technician PAC Members at the Time of Publication

Mr. D. Lehmann	Fort McMurray	Presiding Officer
Ms. R. Jackson	Edmonton	Employer
Mr. C. Olds	Red Deer	Employer
Ms. D. Cherniawsky	Calgary	Employee
Mr. A. Tichler	Redcliff	Employee

Alberta Government

Alberta Advanced Education works with industry, employer and employee organizations and technical training providers to:

- Facilitate industry's development and maintenance of training and certification standards
- Provide registration and counselling services to apprentices and employers
- Coordinate technical training in collaboration with training providers
- Certify apprentices and others who meet industry standards

Technical Institutes and Colleges

The technical institutes and colleges are key participants in Alberta's apprenticeship and industry training system. They work with the board, industry committees and Alberta Advanced Education to enhance access and responsiveness to industry needs through the delivery of the technical training component of apprenticeship programs. They develop lesson plans from the course outlines established by industry and provide technical training to apprentices.

Apprenticeship Safety

Safe working procedures and conditions, incident/injury prevention, and the preservation of health are of primary importance in apprenticeship programs in Alberta. These responsibilities are shared and require the joint efforts of government, employers, employees, apprentices and the public. Therefore, it is imperative that all parties are aware of circumstances that may lead to injury or harm.

Safe learning experiences and healthy environments can be created by controlling the variables and behaviours that may contribute to or cause an incident or injury. By practicing a safe and healthy attitude, everyone can enjoy the benefit of an incident and injury free environment.

Alberta Apprenticeship and Industry Training Board Safety Policy

The Alberta Apprenticeship and Industry Training Board (board) fully supports safe learning and working environments and emphasizes the importance of safety awareness and education throughout apprenticeship training- in both on-the- job training and technical training. The board also recognizes that safety awareness and education begins on the first day of on-the-job training and thereby is the initial and ongoing responsibility of the employer and the apprentice as required under workplace health and safety training. However the board encourages that safe workplace behaviour is modeled not only during on-the-job training but also during all aspects of technical training, in particular, shop or lab instruction. Therefore the board recognizes that safety awareness and training in apprenticeship technical training reinforces, but does not replace, employer safety training that is required under workplace health and safety legislation.

The board has established a policy with respect to safety awareness and training:

> **The board promotes and supports safe workplaces, which embody a culture of safety for all apprentices, employers and employees. Employer required safety training is the responsibility of the employer and the apprentice, as required under legislation other than the *Apprenticeship and Industry Training Act*.**

The board's complete document on its 'Apprenticeship Safety Training Policy' is available at www.tradesecrets.alberta.ca; access the website and conduct a search for 'safety training policy'.

Implementation of the policy includes three common safety learning outcomes and objectives for all trade course outlines. These common learning outcomes ensure that each course outline utilizes common language consistent with workplace health and safety terminology. Under the title of 'Standard Workplace Safety', this first section of each trade course outline enables the delivery of generic safety training; technical training providers will provide trade specific examples related to the content delivery of course outline safety training.

Occupational Health and Safety

A tradesperson is often exposed to more hazards than any other person in the work force and therefore should be familiar with and apply the Occupational Health and Safety Act, Regulations and Code when dealing with personal safety and the special safety rules that apply to all daily tasks.

Occupational Health and Safety (A division of Alberta Human Services) conducts periodic inspections of workplaces to ensure that safety regulations for industry are being observed.

Additional information is available at www.humanservice.alberta.ca

Technical Training

Apprenticeship technical training is delivered by the technical institutes and many colleges in the public post-secondary system throughout Alberta. The colleges and institutes are committed to delivering the technical training component of Alberta apprenticeship programs in a safe, efficient and effective manner. All training providers place great emphasis on safe technical practices that complement safe workplace practices and help to develop a skilled, safe workforce.

The following institutions deliver Parts Technician Apprenticeship Technical Training:

SAIT
NAIT
Red Deer College
Lakeland College
Lethbridge College
Grande Prairie Regional College

Procedures for Recommending Revisions to the Course Outline

Advanced Education has prepared this course outline in partnership with the Parts Technician Provincial Apprenticeship Committee.

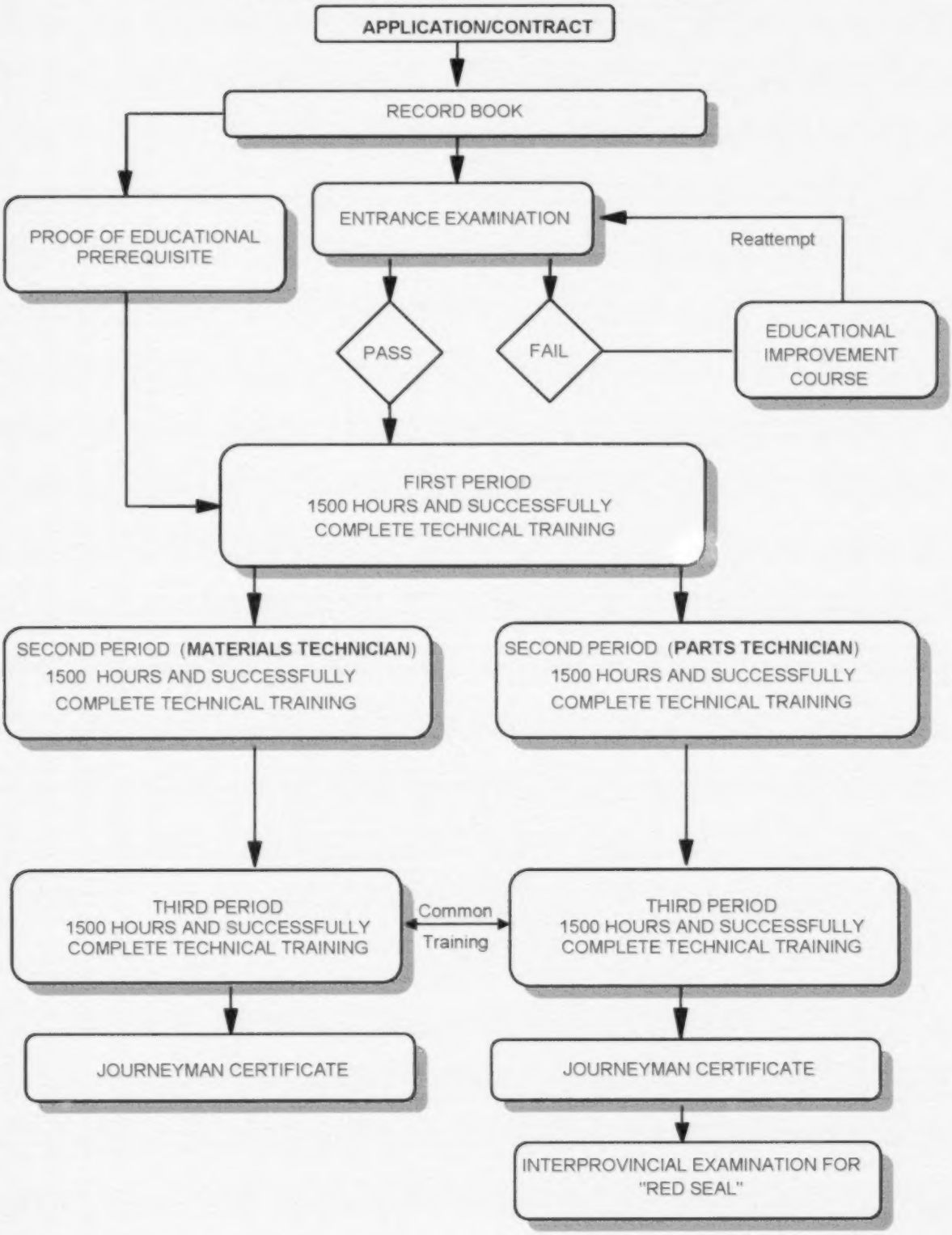
This course outline was approved on December 14, 2012 by the Alberta Apprenticeship and Industry Training Board on a recommendation from the provincial apprenticeship committee. The valuable input provided by representatives of industry and the institutions that provide the technical training is acknowledged.

Any concerned individual or group in the province of Alberta may make recommendations for change by writing to:

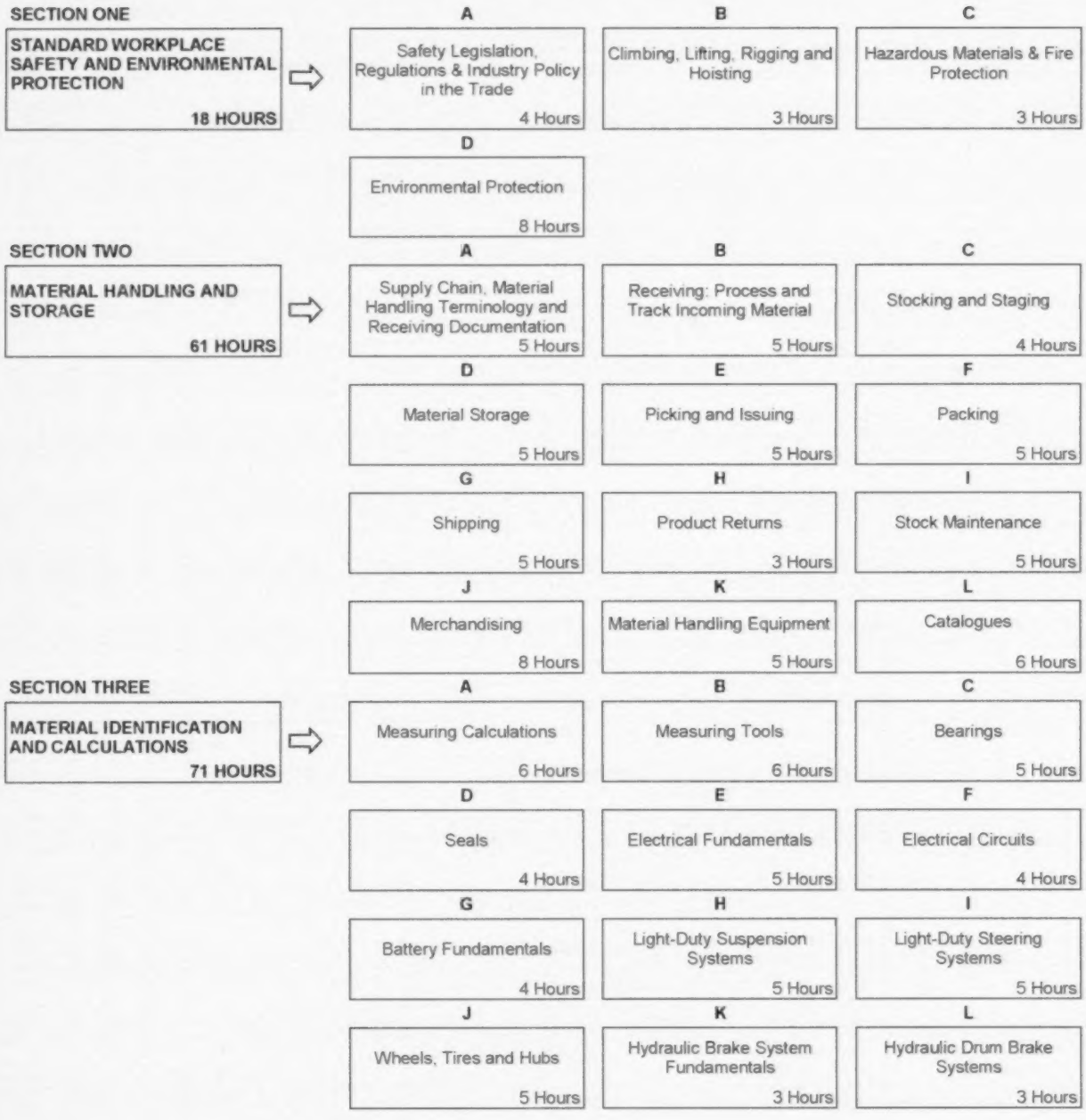
Parts Technician Provincial Apprenticeship Committee
c/o Industry Programs and Standards
Apprenticeship and Industry Training
Advanced Education
10th Floor, Commerce Place
10155 102 Street NW
Edmonton AB T5J 4L5

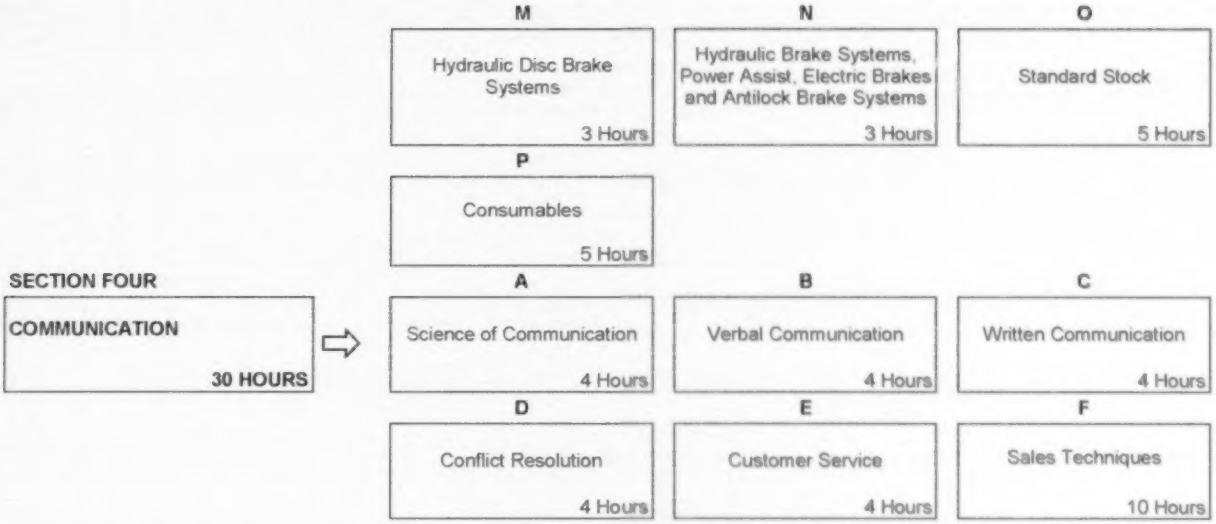
It is requested that recommendations for change refer to specific areas and state references used. Recommendations for change will be placed on the agenda for regular meetings of the Parts Technician provincial apprenticeship committee.

APPRENTICESHIP ROUTE TOWARD CERTIFICATION



Parts Technician Training Profile
FIRST PERIOD
(6 Weeks 30 Hours per Week – Total of 180 Hours)




M
Hydraulic Disc Brake Systems
3 Hours
N
Hydraulic Brake Systems, Power Assist, Electric Brakes and Antilock Brake Systems
3 Hours
O
Standard Stock
5 Hours
P
Consumables
5 Hours
SECTION FOUR
COMMUNICATION
30 HOURS
A
Science of Communication
4 Hours
B
Verbal Communication
4 Hours
C
Written Communication
4 Hours
D
Conflict Resolution
4 Hours
E
Customer Service
4 Hours
F
Sales Techniques
10 Hours

SECOND PERIOD—PARTS TECHNICIAN
(8 Weeks 30 Hours per Week – Total of 240 Hours)

SECTION ONE

ENGINES AND RELATED SYSTEMS
73 HOURS

A	B	C
Engine Types, Applications and Designs 5 Hours	Engine Blocks and Liners 3 Hours	Pistons, Piston Rings and Connecting Rods 3 Hours
D	**E**	**F**
Crankshafts and Related Parts 3 Hours	Camshafts and Related Parts 3 Hours	Cylinder Heads and Related Parts 3 Hours
G	**H**	**I**
Engine Cooling Systems 5 Hours	Engine Lubrication Systems 3 Hours	Exhaust Systems 5 Hours
J	**K**	**L**
Air Induction Systems 5 Hours	Fuel Properties and Supply Systems 4 Hours	Gasoline Fuel Injection Systems 4 Hours
M	**N**	**O**
Diesel Fuel Injection 4 Hours	Liquefied Petroleum Gas/Compressed Natural Gas Fuel Systems 3 Hours	Emission Control Systems 5 Hours
P	**Q**	**R**
Catalytic Converters and Exhaust Gas Recirculation Systems 5 Hours	Air Conditioning System Fundamentals 5 Hours	Air Conditioning System Operation 5 Hours

SECTION TWO

POWER TRAIN
75 HOURS

A	B	C
Chains, Sprockets, Belts and Pulleys 3 Hours	Gearing Principles 5 Hours	Clutches 5 Hours
D	**E**	**F**
Light-Duty Manual Transmissions 5 Hours	Heavy-Duty Manual Transmissions and PTOs 7 Hours	Drivelines 5 Hours
G	**H**	**I**
Light-Duty Drive Axle Assemblies 5 Hours	Heavy-Duty Drive Axle Assemblies 5 Hours	All-Wheel Drive 5 Hours
J	**K**	**L**
Automatic Transmission Fundamentals 10 Hours	Automatic Transmission Internal Operations 10 Hours	Automatic Transmission Hydraulic Components 10 Hours

SECTION THREE

HYDRAULICS, STEERING, SUSPENSION AND AIR BRAKES
43 HOURS

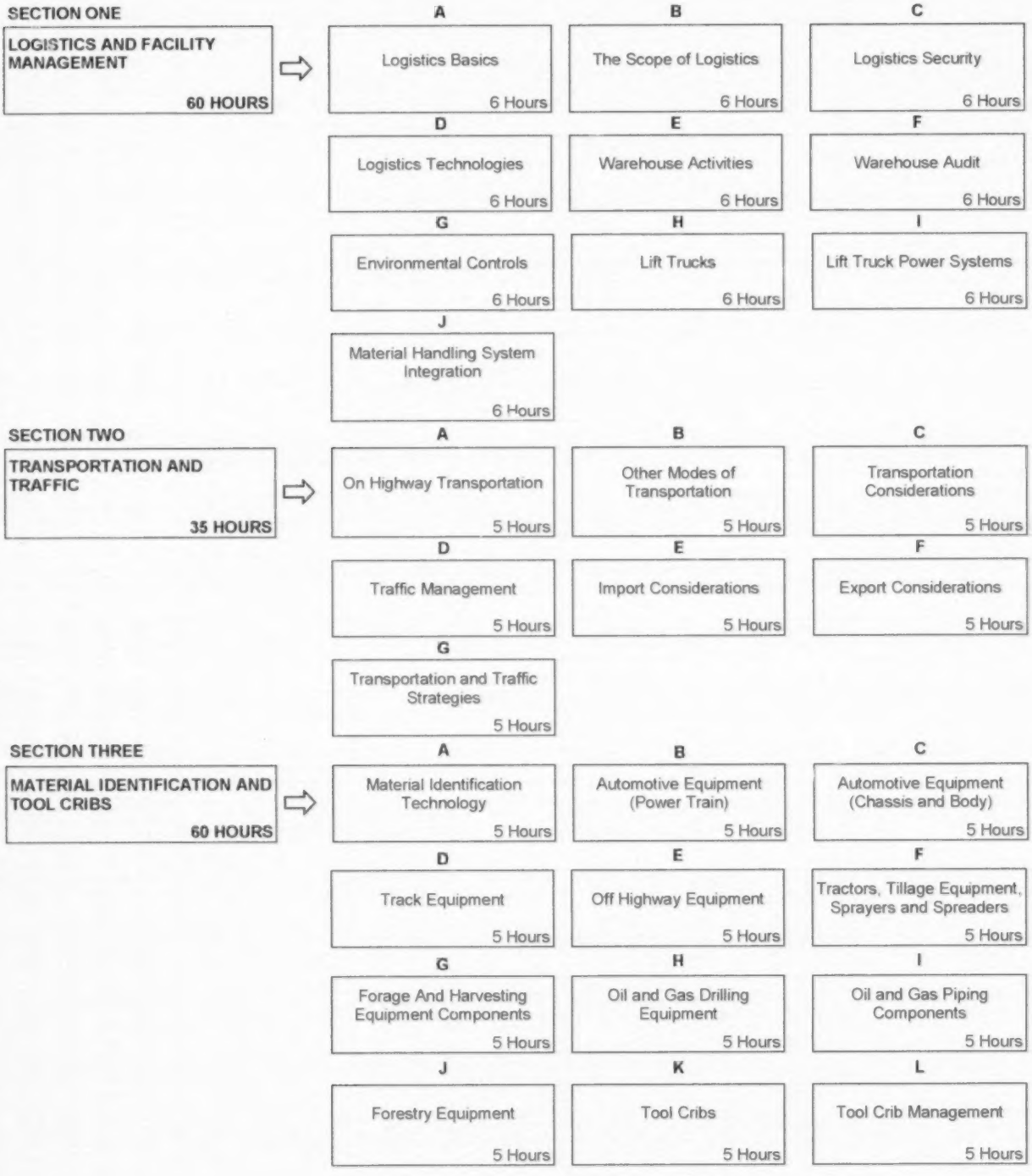
A	B	C
Hydraulic Fundamentals 4 Hours	Hydraulic System Components: Reservoir, Filters, Hoses and Coolers 5 Hours	Hydraulic System Components: Pumps and Valves 5 Hours
D	**E**	**F**
Hydraulic Systems Components: Cylinders, Motors and Accumulators 8 Hours	Heavy-Duty Suspension Systems 5 Hours	Heavy-Duty Steering Systems 5 Hours

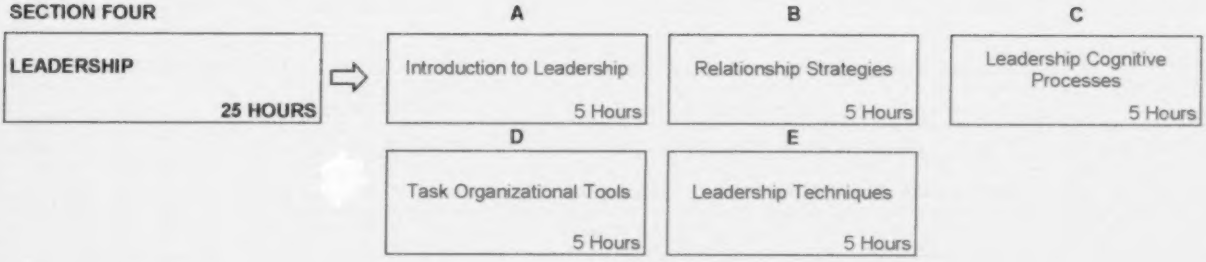
SECTION FOUR

ELECTRICAL, AUTOBODY, AGRICULTURE AND MOBILE INDUSTRIAL EQUIPMENT
49 HOURS

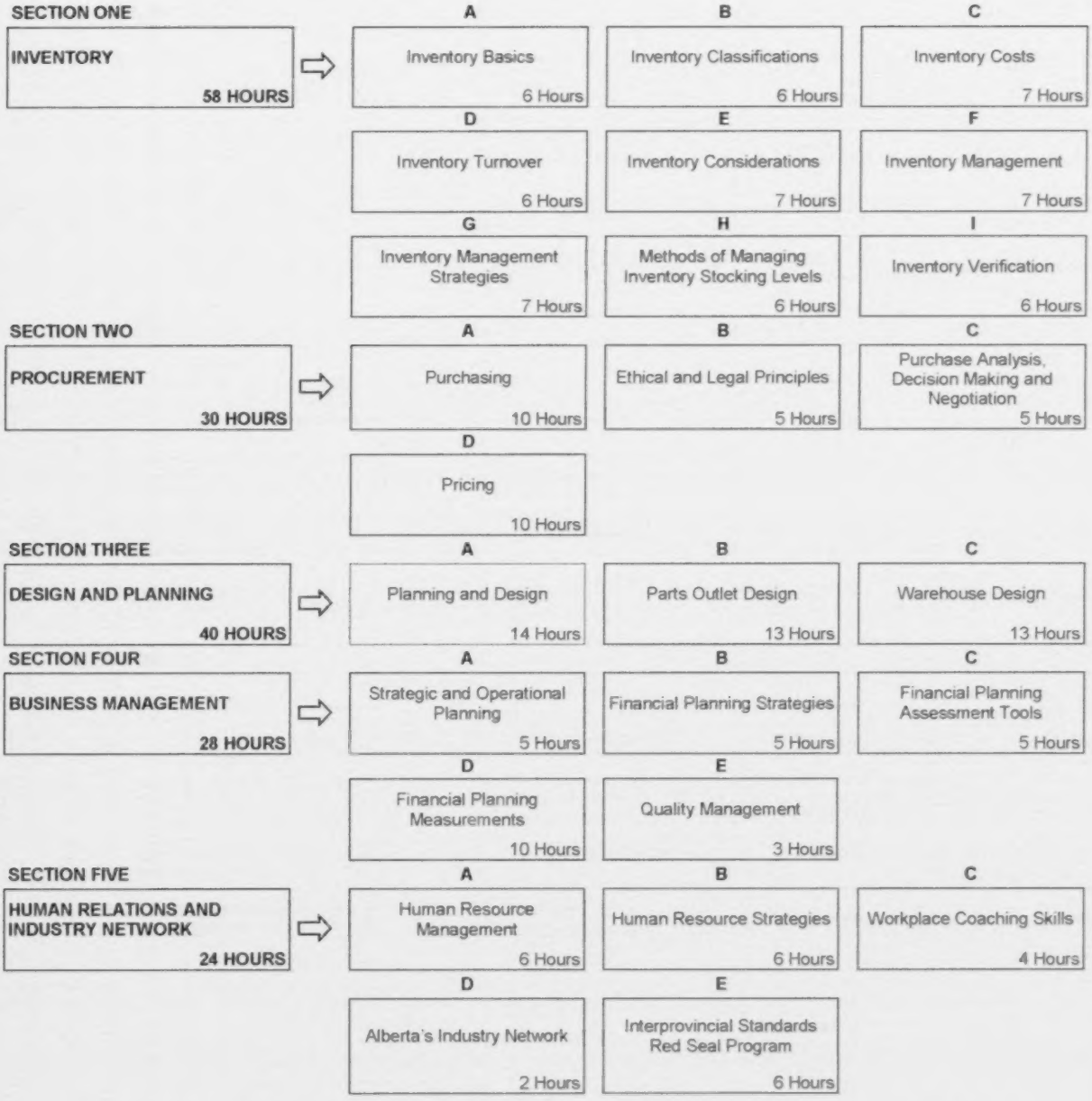
G Air Brakes: Fundamentals 4 Hours	**H** Air Brakes: Truck and Tractor 4 Hours	**I** Air Brakes: Trailers 3 Hours
A Charging Systems 4 Hours	**B** Starter Motor Systems 4 Hours	**C** Ignition Systems 4 Hours
D Electrical Accessory Systems 4 Hours	**E** Auto Body Panel and Body Parts Identification 5 Hours	**F** Auto Body Glass and Restraint Systems 2 Hours
G Auto Body Reconditioning Materials 3 Hours	**H** Tillage, Seeding, Spraying and Spreading Equipment 6 Hours	**I** Forage and Harvesting Equipment 4 Hours
J Tractors 2 Hours	**K** Mobile Industrial Equipment Identification 6 Hours	**L** Material Handling Equipment Identification 5 Hours

SECOND PERIOD—MATERIALS TECHNICIAN
(6 Weeks 30 Hours per Week – Total of 180 Hours)




SECTION FOUR
LEADERSHIP
25 HOURS
A
Introduction to Leadership
5 Hours
B
Relationship Strategies
5 Hours
C
Leadership Cognitive Processes
5 Hours
D
Task Organizational Tools
5 Hours
E
Leadership Techniques
5 Hours

THIRD PERIOD
(6 Weeks 30 Hours per Week – Total of 180 Hours)



NOTE: The hours stated are for guidance and should be adhered to as closely as possible. However, adjustments must be made for rate of apprentice learning, statutory holidays, registration and examinations for the training establishment and Apprenticeship and Industry Training.

FIRST PERIOD TECHNICAL TRAINING
PARTS TECHNICIAN TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE .. STANDARD WORKPLACE SAFETYAND ENVIRONMENTAL PROTECTION ..... 18 HOURS

A. Safety Legislation, Regulations and Industry Policy in the Trade ..... 4 Hours

Outcome: ***Describe legislation, regulations and practices intended to ensure a safe work place in this trade.***

1. Demonstrate the ability to apply the Occupational Health and Safety Act, Regulation and Code.
2. Explain the role of the employer and employee in regard to Occupational Health and Safety (OH&S) regulations, Worksite Hazardous Materials Information Systems (WHMIS), fire regulations, Workers Compensation Board regulations, and related advisory bodies and agencies.
3. Explain industry practices for hazard assessment and control procedures.
4. Describe the responsibilities of workers and employers to apply emergency procedures.
5. Describe positive tradesperson attitudes with respect to housekeeping, personal protective equipment and emergency procedures.
6. Describe the roles and responsibilities of employers and employees with respect to the selection and use of personal protective equipment (PPE).
7. Select, use and maintain appropriate PPE for worksite applications.

B. Climbing, Lifting, Rigging and Hoisting ..... 3 Hours

Outcome: ***Describe the use of personal protective equipment (PPE) and safe practices for climbing, lifting, rigging and hoisting in this trade.***

1. Select, use and maintain specialized PPE for climbing, lifting and load moving equipment.
2. Describe manual lifting procedures using correct body mechanics.
3. Describe rigging hardware and the safety factor associated with each item.
4. Select the correct equipment for rigging typical loads.
5. Describe hoisting and load moving procedures.

C. Hazardous Materials and Fire Protection ..... 3 Hours

Outcome: ***Describe the safety practices for hazardous materials and fire protection in this trade.***

1. Describe the roles, responsibilities features and practices related to the workplace hazardous materials information system (WHMIS) program.
2. Describe the three key elements of WHMIS.
3. Describe handling, storing and transporting procedures when dealing with hazardous material.
4. Describe safe venting procedures when working with hazardous materials.
5. Describe fire hazards, classes, procedures and equipment related to fire protection.

D. Environmental Protection .....8 Hours

Outcome: Adhere to environmental protection legislation.

1. Describe environmentally sound practices and procedures at the worksite.
2. Outline the compliance requirements of current legislation and hazardous waste regulations.
3. Describe strategies to reduce waste generated at the worksite.
4. Explain spill prevention and spill containment strategies.
5. Explain release prevention and containment strategies.

SECTION TWO .....MATERIAL HANDLING AND STORAGE.....61 HOURS

A. Supply Chain, Material Handling Terminology and Receiving Documentation.....5 Hours

Outcome: Receive incoming material.

1. Outline the supply chain.
2. Define material handling terminology.
3. Describe the documentation related to receiving.

B. Receiving: Process and Track Incoming Material .....5 Hours

Outcome: Process and track incoming material.

1. Explain the procedure for processing shipments of materials received.
2. Describe the importance of paying attention to detail for receiving procedure.
3. Describe quality assurance standards and requirements.
4. Describe GPS and RFID technology.

C. Stocking and Staging.....4 Hours

Outcome: Stock and stage incoming material.

1. Describe the importance of proper stock identification and locating of materials.
2. Apply stocking procedures.

D. Material Storage .....5 Hours

Outcome: Store materials.

1. Describe considerations for the storage of materials.
2. Identify the benefits of appropriate storage methods.
3. Describe legislative and legal requirements relating to the storage of particular materials.
4. Describe common storage systems used on the worksite.

E. Picking and Issuing.....5 Hours

Outcome: Fill and issue orders.

1. Explain the order cycle, including authorization and documentation.
2. Describe picking procedures.

3. Describe issuing procedures.
4. Identify reasons for product allocation.

F. Packing ..... **5 Hours**

Outcome: Pack materials.

1. Describe packing materials.
2. Describe packing methods.

G. Shipping ..... **5 Hours**

Outcome: Ship materials.

1. Identify types of shipments.
2. Determine mode of shipping.
3. Identify documentation related to shipping.

H. Product Returns ..... **3 Hours**

Outcome: Process product returns.

1. Identify internal and external product return procedures and related documentation.
2. Outline policies and procedures for maintaining a core/exchange program.

I. Stock Maintenance ..... **5 Hours**

Outcome: Maintain stock.

1. Explain stock maintenance procedures.

J. Merchandising ..... **8 Hours**

Outcome: Implement merchandising strategies.

1. Define merchandising and merchandising programs.
2. Describe merchandising related to daily operations.
3. Describe locations and methods for building displays.

K. Material Handling Equipment ..... **5 Hours**

Outcome: Describe material handling equipment and safety markings.

1. Identify material handling equipment.
2. Identify packaging equipment.
3. Identify hazards related to material handling equipment.
4. Describe safety markings applied to material handling equipment.

L. Catalogues ..... **6 Hours**

Outcome: Explain the purpose of material catalogues.

1. Describe the function of catalogues.
2. Describe the structure of catalogues.

3. Identify types of catalogues.
4. Describe the purpose of vehicle identification numbers and serial numbers.

SECTION THREE: ..... MATERIAL IDENTIFICATION AND CALCULATIONS .....71 HOURS

A. Measuring Calculations .....6 Hours

Outcome: Perform calculations related to common measurements.

1. Perform calculations related to measurement using imperial and metric units.
2. Explain the term torque.
3. Convert numbers between decimals and fractions.
4. Calculate percentages.

B. Measuring Tools .....6 Hours

Outcome: Use measuring tools.

1. Perform linear measurements in imperial and SI units.
2. Demonstrate use of measuring tools.

C. Bearings .....5 Hours

Outcome: Describe common bearings.

1. State functions of bearings.
2. Describe friction bearings.
3. Describe anti friction bearings.
4. Describe storage methods and methods of supplying bearings.

D. Seals .....4 Hours

Outcome: Describe seals and their functions.

1. State the function of seals.
2. Identify seals and their applications.
3. Describe information required to supply replacement seals.

E. Electrical Fundamentals .....5 Hours

Outcome: Explain the fundamentals of electricity.

1. Recognize common electrical symbols used in the trade.
2. Explain the physical qualities of insulators, conductors and semiconductors.
3. Explain magnetism and electromagnetism and their properties.
4. Explain the measurement of electromotive force, current, resistance and power.
5. Describe the purpose of current control devices.

F. Electrical Circuits ..... 4 Hours

Outcome: Explain the fundamentals of electrical circuits.

1. Identify the three basic circuits and their basic properties.
2. Explain open, shorted or grounded circuits.
3. Describe how to use a digital multimeter.
4. Explain the operation of diodes, Zener diodes and transistors.

G. Battery Fundamentals ..... 4 Hours

Outcome: Describe the operation of the battery and handling procedures.

1. Describe common batteries, their advantages and disadvantages.
2. Identify hazards encountered with lead-acid batteries.
3. Explain battery construction, sizing and capacity.
4. List precautions and procedures for boosting batteries.
5. List precautions and procedures for charging batteries.
6. Describe handling, storage and disposal of batteries and electrolyte.

H. Light-Duty Suspension Systems ..... 5 Hours

Outcome: Describe the operation of light-duty suspension systems.

1. Explain the operation of light-duty suspension systems.
2. Describe springs used in light-duty suspension systems.
3. Describe the operation of shock absorbers.
4. Describe the operation of suspension components.
5. Describe suspension designs.
6. Identify common replacement parts and related sales opportunities.

I. Light-Duty Steering Systems ..... 5 Hours

Outcome: Describe the operation of light-duty steering systems and identify replacement parts.

1. Identify steering linkage types and explain their operation.
2. Explain the function and lubrication requirements of common light-duty manual steering gears.
3. Explain the function of power steering gears.
4. Describe the operation of power steering pumps.
5. Explain the function and design features of steering column safety features.
6. Identify common replacement parts and related sales opportunities.

J. Wheels, Tires and Hubs ..... 5 Hours

Outcome: Describe the design features and purpose of wheels, tires and hubs.

1. Explain the construction, sizing and rating of automotive and light truck tires and wheels.
2. Explain the construction, sizing and rating of heavy duty truck tires and wheels.
3. Explain the purpose of static and dynamic balancing.
4. Describe causes of tire wear and common repair methods.

5. Identify components of a wheel hub and spindle assembly.
6. Identify common replacement parts and related sales opportunities.

K. Hydraulic Brake System Fundamentals.....3 Hours

Outcome: Describe the fundamentals of brake systems and identify types of brake fluids.

1. Explain the principles that apply to brake systems.
2. State Pascal's law and its implications for brake systems.
3. Choose the correct brake fluid for a given application based on purpose, function and characteristics of brake fluids.
4. Explain the operation of common brake components.
5. Describe the operation of hydraulic components when used as a system.
6. Identify common replacement parts and related sales opportunities.

L. Hydraulic Drum Brake Systems.....3 Hours

Outcome: Describe the operation of hydraulic drum brake systems.

1. Explain the operation of drum brake system components.
2. Explain the operation of drum-type parking brake systems.
3. Identify common replacement parts and related sales opportunities.

M. Hydraulic Disc Brake Systems .....3 Hours

Outcome: Describe the operation of hydraulic disc brake systems.

1. Explain the operation of disc brake systems.
2. Explain the operation of disc-type parking brake systems.
3. Identify common replacement parts and related sales opportunities.

N. Hydraulic Brake Systems, Power Assist, Electric Brakes and Antilock Brake Systems .....3 Hours

Outcome: Describe the operation and identify supply replacement parts of assisted brake systems, electric brake systems and antilock brake systems.

1. Describe the operation of vacuum-operated power brake units.
2. Describe the operation of hydraulically operated power brake units.
3. Describe the operation of the electro-hydraulic power brake units.
4. Explain operation of air-over-hydraulic brake booster systems.
5. Explain operation for electric braking systems.
6. Explain the operation of an antilock brake system (ABS).
7. Identify common replacement parts and related sales opportunities.

O. Standard Stock .....5 Hours

Outcome: Identify standard stock items common to the trade.

1. Identify fastening devices, including alloys and grades.
2. Identify lines and fittings.
3. Identify specialty items.

P. Consumables ..... **5 Hours**

Outcome: Identify consumables.

1. Identify compounds and mixtures.
2. Identify shop supplies.
3. Identify hazards related to repackaging and storing consumables.

SECTION FOUR ..... **COMMUNICATION** ..... **30 HOURS**

A. Science of Communication ..... **4 Hours**

Outcome: Identify effective communication.

1. Describe communication (basic psychology and nature).
2. Describe communication barriers.
3. Describe what makes communication work.
4. Describe modes of communication.

B. Verbal Communication ..... **4 Hours**

Outcome: Apply verbal communication skills.

1. Identify verbal communication skills.
2. Identify effective listening skills.
3. Describe the relationship between verbal communication and interpersonal/customer relations.
4. Use verbal communication skills to deliver a presentation.

C. Written Communication ..... **4 Hours**

Outcome: Apply written communication skills.

1. Identify when and why a specific form of written communication is used.
2. Organize written information.
3. Describe the relationship between written communication and interpersonal/customer relations.

D. Conflict Resolution ..... **4 Hours**

Outcome: Discuss conflict resolution strategies.

1. Define conflict.
2. Describe conflict resolution strategies.
3. Describe the advantages and disadvantages of conflict.

E. Customer Service ..... **4 Hours**

Outcome: Identify the goals of customer service.

1. Describe approaches used to provide customer service.
2. Discuss customer expectations.
3. Describe the impact of customer service.

F. Sales Techniques .....10 Hours

Outcome: Describe sales techniques.

1. Describe the attributes of a salesperson.
2. Identify sales methods.
3. Describe basic sales psychology.
4. Identify sales leads.
5. Describe techniques for closing sales.

SECOND PERIOD TECHNICAL TRAINING
PARTS TECHNICIAN TRADE
PARTS TECHNICIAN BRANCH
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE:.....ENGINES AND RELATED SYSTEMS..... 73 HOURS

A. Engine Types, Applications and Designs .....5 Hours

Outcome: Explain the operating principles of two- and four-stroke internal combustion engines.

1. Explain the stages of development of the internal combustion engine.
2. Explain common engine components, terms, definitions and functions.
3. Explain common methods of classifying engines.
4. Explain the principles of engine operation for four-stroke and two-stroke cycle engines.
5. Compare the physical and operational differences between engines using different types of fuels.

B. Engine Blocks and Liners .....3 Hours

Outcome: Identify engine construction and materials.

1. State the function of the engine cylinder block.
2. Identify cylinder block construction and design features.
3. Describe the construction and design features of removable cylinder liners.
4. Identify common replacement parts and related sales opportunities.

C. Pistons, Piston Rings and Connecting Rods.....3 Hours

Outcome: Identify types of pistons, piston rings and connecting rods and their purpose.

1. Explain the function and design features of pistons and piston pins.
2. Explain the function and design features of piston rings.
3. Explain the function and design features of connecting rods.
4. Identify common replacement parts and related sales opportunities.

D. Crankshafts and Related Parts.....3 Hours

Outcome: Describe the functions and design features of crankshafts and their related parts.

1. Explain the function and design features of crankshafts.
2. Describe the function and design features of friction bearings specific to engines.
3. Explain the function and design features of balance shafts, auxiliary shafts, flywheels and harmonic balancers.
4. State the function of crankshaft related parts.
5. Identify common replacement parts and related sales opportunities.

E. Camshafts and Related Parts ..... 3 Hours

Outcome: Describe the functions and design features of camshafts and related parts.

1. Explain the function and design features of camshafts, and related parts.
2. Explain the function and design features of camshaft followers.
3. Explain camshaft drive mechanisms and timing.
4. Identify common replacement parts and related sales opportunities.

F. Cylinder Heads and Related Parts ..... 3 Hours

Outcome: Identify types, designs and purpose of cylinder heads.

1. Explain the function and design features of cylinder heads.
2. State the purpose of and identify common combustion chamber designs used in gasoline and diesel engines.
3. Describe the construction and design features of engine valves and related components.
4. Describe the construction and design features of valve train components.
5. Identify cylinder head sealing and retention devices.
6. Identify common replacement parts and related sales opportunities.

G. Engine Cooling Systems ..... 5 Hours

Outcome: Describe the characteristics of engine coolant and cooling systems.

1. Describe the physical principles involved in heat transfer.
2. Describe the operation of air cooling systems and their related components.
3. Describe the operation of liquid cooling systems and their related components.
4. Explain the operation of a thermostatic fan clutch, a thermostat and shutters.
5. Explain the operation of temperature indicators.
6. Identify common replacement parts and related sales opportunities.

H. Engine Lubrication Systems ..... 3 Hours

Outcome: Describe the characteristics of engine lubrication systems.

1. Describe the common functions and characteristics of lubricating oils.
2. Explain the operation of lubrication systems and their related components.
3. State the function and rating of filtration devices.
4. Describe procedures to follow when disposing of lubricants and filters.
5. Describe the use of oil analysis as a diagnostic tool.
6. Identify common replacement parts and related sales opportunities.

I. Exhaust Systems ..... 5 Hours

Outcome: Describe the function of exhaust systems.

1. Identify exhaust system components.
2. Explain the function and design features of exhaust manifolds.
3. Explain the function and design features of exhaust pipes, mufflers and related parts.

4. Identify common replacement parts and related sales opportunities.

J. Air Induction Systems ..... 5 Hours

Outcome: Describe the function of air induction systems.

1. Describe air induction systems and related components used on engines.
2. Describe the function of pre-cleaners.
3. Describe the functions of common air cleaners.
4. Describe the purpose and design features of intake manifolds.
5. Describe the operating principles of superchargers and turbochargers.
6. Identify common replacement parts and related sales opportunities.

K. Fuel Properties and Supply Systems ..... 4 Hours

Outcome: Describe the characteristics of fuels, the gasoline fuel supply system and identify common replacement parts.

1. Describe the chemical properties of fuels.
2. Describe the characteristics of gasoline.
3. Describe handling and storage practices for gasoline and diesel fuels.
4. Explain the purpose and operation of gasoline fuel tanks, lines and filters.
5. Describe the purpose and operation of fuel pumps and pressure regulators.

L. Gasoline Fuel Injection Systems ..... 4 Hours

Outcome: Describe the components, operation and purpose of gasoline fuel injection systems.

1. Describe components necessary to operate a computer-controlled fuel injection system.
2. Describe the design and function of a throttle body fuel injection system.
3. Describe the design and function of a multiport fuel injection system.
4. Identify common replacement parts and related sales opportunities.

M. Diesel Fuel Injection ..... 4 Hours

Outcome: Describe the diesel fuel supply system and diesel fuel injection systems.

1. Describe the characteristics of diesel fuel.
2. Explain the purpose and operation of diesel fuel tanks, pumps, lines and filters.
3. Explain the fundamental operation and design features of diesel fuel injection systems and their related components.
4. Describe the operation of injection pumps and injectors.
5. Describe diesel fuel injection system electronic controls.
6. Describe accessory and protective diesel fuel systems.
7. Identify common replacement parts and related sales opportunities.

N. Liquefied Petroleum Gas/Compressed Natural Gas Fuel Systems ..... 3 Hours

Outcome: Describe alternate fuel delivery systems.

1. Describe the characteristics of liquefied petroleum gas (LPG) (propane).

2. Explain the operation of the components of liquefied petroleum gas fuel systems.
3. Describe the characteristics of natural gas.
4. Explain the operation of the components of natural gas fuel system.
5. Identify common replacement parts and related sales opportunities.

O. Emission Control Systems ..... 5 Hours

Outcome: Describe the operation and purpose of emission control systems.

1. Explain the scientific principles involving the combustion process, vehicle emissions and their interrelationships.
2. Identify the regulated and non-regulated emissions resulting from combustion.
3. Explain the purpose and operation of evaporative emission systems.
4. Explain the purpose and operation of positive crankcase ventilation systems.
5. Explain the purpose, operation of air injection systems.
6. Identify common replacement parts and related sales opportunities regarding emission control systems.

P. Catalytic Converters and Exhaust Gas Recirculation Systems ..... 5 Hours

Outcome: Describe the major components of catalytic converters and exhaust gas recirculation systems.

1. Explain the operation of catalytic converter systems.
2. Explain the operation of exhaust gas recirculation systems.
3. Explain the effect on exhaust emissions as a result of altering air-fuel ratio (AFR), ignition timing or engine design.
4. Identify common replacement parts and related sales opportunities.

Q. Air Conditioning System Fundamentals ..... 5 Hours

Outcome: Describe the operation and purpose of air conditioning systems.

1. Describe environmental concerns related to fluorocarbon refrigerants.
2. Explain the principles and properties of heat.
3. Explain the properties of refrigerants and refrigerant oils.
4. Describe the handling of refrigerants and refrigerant oils.
5. Explain the operation of air conditioning system components.
6. Identify common replacement air conditioning parts and related sales opportunities.

R. Air Conditioning System Operation ..... 5 Hours

Outcome: Describe the contrast between factory and aftermarket air conditioning systems and describe the operation of air conditioning control and air distribution systems.

1. Describe air conditioning hoses, fittings and service valves.
2. Describe the requirements of a retrofit conditioning system.
3. Explain the operation of components and systems used for temperature control and air distribution.
4. Explain how air conditioning controls may be integrated with other vehicle electronic systems.

5. Compare a factory air conditioning system with an aftermarket system.
6. Identify common replacement parts and related sales opportunities.

SECTION TWO: ..... POWER TRAIN ..... 75 HOURS

A. Chains, Sprockets, Belts and Pulleys ..... 3 Hours

Outcome: Describe chains, sprockets, belts and pulleys.

1. Describe types of chains.
2. Describe types of sprockets.
3. Describe types of belts.
4. Describe types of pulleys.
5. Calculate drive ratios.

B. Gearing Principles ..... 5 Hours

Outcome: Describe types of gears and calculate gear ratios.

1. Explain gear relationships with regard to ratios and input/output direction.
2. Identify common gear types and applications.

C. Clutches ..... 5 Hours

Outcome: Describe the operation and purpose of clutches.

1. Explain the principles of operation of a clutch.
2. Explain the design features and function of a clutch assembly.
3. Describe the clutch actuating methods.
4. Identify common replacement parts and related sales opportunities.

D. Light-Duty Manual Transmissions ..... 5 Hours

Outcome: Describe the operating principles of light duty manual transmissions and transaxles.

1. Identify types and designs of light duty manual transmissions and transaxles.
2. Identify the major parts of a light duty manual transmission.
3. Describe the functions of synchronizers and shift mechanisms.
4. Describe principles of operation of a light duty manual transmission.
5. Describe principles of operation of a transaxle and follow the path of power.
6. Explain how light-duty manual transmissions and transaxle internal components are lubricated and choose the correct type of lubricant.
7. Identify common replacement parts and related sales opportunities.

E. Heavy-Duty Manual Transmissions and PTOs ..... 7 Hours

Outcome: Describe the operating principles of heavy duty transmissions and PTOs.

1. Identify types and designs of heavy duty manual transmissions.
2. Describe the principles of operation of the major parts of a heavy duty manual transmission.
3. Explain how heavy duty manual transmissions are lubricated.

4. Describe PTO operation.
5. Identify common replacement parts and related sales opportunities.

F. Drivelines ..... 5 Hours

Outcome: Describe the operation of drivelines.

1. Explain the function of common light- and heavy-duty rear-wheel-drive driveline components.
2. Explain the function of common front-wheel-drive driveline components
3. Identify common replacement parts and related sales opportunities.

G. Light-Duty Drive Axle Assemblies ..... 5 Hours

Outcome: Describe the operation of light duty drive axle assemblies.

1. Describe the function of light duty drive axle assemblies.
2. Describe the operation of a standard differential.
3. Describe the operation and of traction-enhancing differentials.
4. Identify types of lubrication for differentials.
5. Identify common replacement parts and related sales opportunities.

H. Heavy-Duty Drive Axle Assemblies ..... 5 Hours

Outcome: Describe the operating principles of heavy duty drive axle assemblies.

1. Identify types and designs of heavy duty drive axle assemblies.
2. Describe the operation of the major parts of a heavy duty drive axle assembly.
3. Describe the operation of a power divider/ two speed axle assembly.
4. Identify types of lubrication for drive axle assemblies.
5. Identify common replacement parts and related sales opportunities.

I. All-Wheel Drive ..... 5 Hours

Outcome: Describe the operation of all wheel drive, four wheel drive and transfer cases.

1. Describe the operation of a manual transfer case.
2. Explain the basic shifting operations of a transfer case with electronic controls.
3. Identify common replacement parts and related sales opportunities.

J. Automatic Transmission Fundamentals ..... 10 Hours

Outcome: Explain the operation of an automatic transmission and describe the types and characteristics of transmission fluids.

1. Explain the operation of an automatic transmission.
2. Explain the types and characteristics of automatic transmission fluids.
3. Explain the operation of a non-lockup torque converter.
4. Explain the operation of a lockup torque converter.
5. Describe the operation of automatic transmission oil pumps.
6. Identify common replacement parts and related sales opportunities.

K. Automatic Transmission Internal Operations ..... 10 Hours

Outcome: Describe the operation of internal automatic transmission components.

1. State the operation of a planetary gear set.
2. Explain the operation of clutch assemblies, pistons and seals.
3. Explain the operation of transmission bands and servo assemblies.
4. Identify common replacement automatic transmission parts and related sales opportunities.

L. Automatic Transmission Hydraulic Components ..... 10 Hours

Outcome: Describe the operation of automatic transmission hydraulic components.

1. Explain the operation of simple types of hydraulic valves used in automatic transmissions.
2. Explain the operation of a manual valve.
3. Describe the operation of pressure-regulating valves used in automatic transmissions.
4. Describe the operation of common types of throttle and modulator valves.
5. Describe the function of governors.
6. Explain the operation of a shift valve.
7. Explain how electronics are used to control an automatic transmission.
8. Identify common replacement parts and related sales opportunities.

SECTION THREE: ..... HYDRAULICS, STEERING, SUSPENSION AND AIR BRAKES ..... 43 HOURS

A. Hydraulic Fundamentals ..... 4 Hours

Outcome: Explain hydraulic principles.

1. Define hydraulic terminology.
2. Define Pascal's law and its application.
3. Using mathematical calculations, explain the hydraulic principles of pressure, force and area.
4. Explain the properties of hydraulic fluid and the criteria for its selection.

B. Hydraulic System Components: Reservoir, Filters, Hoses and Coolers ..... 5 Hours

Outcome: Explain the function of hydraulic system components.

1. State the functions of the hydraulic reservoir and its related components.
2. State the function of filtration devices.
3. Explain the construction and applications of common types of hydraulic conductors.
4. State the function and applications of hydraulic heat exchangers.

C. Hydraulic System Components: Pumps and Valves ..... 5 Hours

Outcome: Explain the function of hydraulic system components.

1. Explain the operating principles of hydraulic pumps.
2. Explain the operation and applications of hydraulic valves.

D. Hydraulic System Components: Cylinders, Motors and Accumulators ..... 8 Hours

Outcome: Explain the function of hydraulic system components.

1. Explain the operating principles of hydraulic cylinders.
2. Explain the operating principles of hydraulic motors.
3. Explain the operating principles of hydraulic accumulators.
4. Identify common replacement parts and related sales opportunities.

E. Heavy-Duty Suspension Systems ..... 5 Hours

Outcome: Describe the operation and purpose of heavy-duty suspension systems.

1. Explain the operation of heavy-duty suspension systems.
2. Describe heavy-duty suspension designs.
3. Identify common replacement parts and related sales opportunities.

F. Heavy-Duty Steering Systems ..... 5 Hours

Outcome: Describe the operation and purpose of heavy-duty steering systems.

1. Explain the operation of heavy-duty industrial equipment steering systems.
2. Explain the operation of heavy-duty truck steering systems.

G. Air Brakes: Fundamentals ..... 4 Hours

Outcome: Explain the operation of an air brake system.

1. Explain the principles of operation of an air brake system.
2. Describe a simple air brake system consisting of a compressor, reservoir, foot valve, steering axle and single drive axle brake chambers and connecting lines.
3. Explain the operation of a typical cam-operated foundation brake.
4. Explain the operation of a typical air disc foundation brake.
5. Identify common replacement air brake system parts and related sales opportunities.

H. Air Brakes: Truck and Tractor ..... 4 Hours

Outcome: Explain the operation of truck/tractor air brake systems.

1. Explain the operation of common air brake supply circuit components.
2. Explain the operation of common primary service brake circuit components.
3. Explain the operation of common secondary service brake circuit components.
4. Explain the operation of common parking/emergency brake circuit components.
5. Identify common replacement parts and related sales opportunities regarding air brake systems.

I. Air Brakes: Trailers ..... 3 Hours

Outcome: Explain the operation of trailer air brake systems and describe the basic operation of an antilock air brake system.

1. Explain the operation of common trailer controls and circuit components.
2. Explain the operation of common components used on trailer brake systems.

3. Explain the operation of an antilock air brake system.
4. Identify common replacement parts and related sales opportunities regarding air brake systems.

SECTION FOUR:..ELECTRICAL, AUTOBODY, AGRICULTURAL AND MOBILE INDUSTRIAL EQUIPMENT.. 49 HOURS

A. Charging Systems ..... 4 Hours

Outcome: Describe the operation of charging systems.

1. Explain the purpose of the charging system.
2. Identify charging system components.
3. Describe the operational characteristics of an alternator.
4. Identify designs of alternators.
5. Identify regulator types and designs.
6. Explain the operation of charging system indicator circuits.
7. Identify common replacement parts of a charging system.

B. Starter Motor Systems ..... 4 Hours

Outcome: Describe the operation of cranking systems.

1. Explain the operation of electrical starter motors and their related components.
2. Explain the operation of starter lockout devices.
3. State the function of non-electric cranking systems.
4. Identify common replacement parts and related sales opportunities.

C. Ignition Systems ..... 4 Hours

Outcome: Describe the operation of ignition systems.

1. Explain the operation of an ignition system and its related components.
2. Explain the operation of an electronic ignition system.
3. Explain the basic operation of a distributorless ignition system.
4. Explain the operation of magneto ignition systems.
5. Identify common replacement parts and related sales opportunities.

D. Electrical Accessory Systems ..... 4 Hours

Outcome: Identify replacement parts related to electrical accessories.

1. Explain the operation of electrical accessory circuits.
2. Explain the operation of lighting systems.
3. Identify common replacement parts and related sales opportunities.

E. Auto Body Panel and Body Parts Identification ..... 5 Hours

Outcome: Identify auto body panels and body parts.

1. Discuss identification information required for auto body panels and body parts.
2. Describe body panels.
3. Describe auto body parts.

F. Auto Body Glass and Restraint Systems ..... 2 Hours

Outcome: Identify auto body glass and restraint system components.

1. Describe automotive glass.
2. Describe restraint systems.

G. Auto Body Reconditioning Materials ..... 3 Hours

Outcome: Identify auto body reconditioning materials.

1. Describe abrasives.
2. Describe bonding and adhesive products.
3. Describe types of paints and finishes.

H. Tillage, Seeding, Spraying and Spreading Equipment ..... 6 Hours

Outcome: Describe tillage, seeding, spraying and spreading equipment.

1. Describe primary tillage equipment.
2. Identify common replacement components for primary tillage equipment.
3. Describe secondary tillage equipment.
4. Identify common replacement components for secondary tillage equipment.
5. Describe seeding equipment.
6. Identify common replacement parts for seeding equipment.
7. Describe spreaders and sprayers.
8. Identify common replacement parts for spreaders and sprayers.

I. Forage and Harvesting Equipment ..... 4 Hours

Outcome: Describe forage and harvesting equipment.

1. Describe forage equipment.
2. Identify common replacement parts for forage equipment.
3. Describe harvesting equipment.
4. Identify common replacement parts for harvesting equipment.

J. Tractors ..... 2 Hours

Outcome: Describe tractors.

1. Describe types of tractors.
2. Identify major components of tractors.
3. Explain the importance of safety devices.
4. Identify common replacement parts used on tractors.

K. Mobile Industrial Equipment Identification ..... 6 Hours

Outcome: Identify mobile industrial equipment.

1. Describe types of mobile industrial equipment.
2. Identify common replacement parts for mobile industrial equipment.

L. Material Handling Equipment Identification ..... 5 Hours

Outcome: ***Identify material handling equipment.***

1. Describe types of material handling equipment.
2. Identify common replacement parts for material handling equipment.

SECOND PERIOD TECHNICAL TRAINING
PARTS TECHNICIAN TRADE
MATERIALS TECHNICIAN BRANCH
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE.....LOGISTICS AND FACILITY MANAGEMENT ..... .60 HOURS

A. Logistics Basics.....6 Hours

Outcome: Examine logistics.

1. Examine the relationship between transportation and logistics.
2. Examine the relationships between the channels that make up the supply chain.
3. Examine the relationship between reverse logistics and supply chain efficiency.
4. Examine the issues that have an effect on logistics.
5. Examine tradeoffs in logistics.

B. The Scope of Logistics.....6 Hours

Outcome: Examine the scope of logistics.

1. Describe the responsibilities of logistics management.
2. Describe procurement logistics.
3. Describe production logistics.
4. Examine distribution logistics.
5. Compare private and public logistics networks.

C. Logistics Security.....6 Hours

Outcome: Determine security requirements.

1. Explain the concept of product ownership throughout the supply chain.
2. Examine methods of reducing security risks.
3. Determine security methods for goods in transit.
4. Determine requirements for product and inventory information security.
5. Determine loss prevention strategies.

D. Logistics Technologies.....6 Hours

Outcome: Examine the technologies used in logistics.

1. Examine supply chain management and product tracking systems.
2. Examine warehouse management systems.
3. Examine productivity tracking systems.
4. Examine human resource tracking systems.

E. Warehouse Activities ..... 6 Hours

Outcome: Analyze warehouse activity.

1. Discuss data measurement and benchmarking systems.
2. Identify activity measurements.
3. Measure warehouse activities.
4. Describe the use of product activity measurements.
5. Analyze data in relation to benchmarks.

F. Warehouse Audit ..... 6 Hours

Outcome: Describe warehouse auditing.

1. Explain the rationale for auditing.
2. Describe internal audits.
3. Describe external audits.

G. Environmental Controls ..... 6 Hours

Outcome: Determine environmental control for products.

1. Describe environmental requirements.
2. Determine environmental controls for storage.
3. Determine environmental controls for transportation.
4. Discuss environmental controls for enhanced profitability.

H. Lift Trucks ..... 6 Hours

Outcome: Describe lift trucks, features and operation.

1. Identify types of lift trucks.
2. Describe lift truck features.
3. Describe operation and use of lift trucks.

I. Lift Truck Power Systems ..... 6 Hours

Outcome: Describe lift truck power sources.

1. Describe lift truck power sources.
2. Describe battery charging and maintenance.

J. Material Handling System Integration ..... 6 hours

Outcome: Discuss options in material handling systems integration.

1. Describe requirements of material handling systems.
2. Describe reason for blending materials handling systems together.
3. Determine alternatives for consideration.

SECTION TWO: ..... TRANSPORTATION AND TRAFFIC ..... 35 HOURS

A. On Highway Transportation ..... 5 Hours

Outcome: Describe transportation methods.

1. Identify methods of transportation.
2. Identify factors affecting transportation.
3. Describe the impact of modes of transportation.
4. Calculate the costs involved with forms of transportation.

B. Other Modes of Transportation ..... 5 Hours

Outcome: Describe other transportation methods.

1. Identify methods of transportation.
2. Identify internal and external factors affecting transportation.
3. Describe the impact of other modes of transportation.
4. Calculate the costs involved with forms of transportation.

C. Transportation Considerations ..... 5 Hours

Outcome: Determine transportation modes.

1. Identify factors affecting transportation.
2. Describe the impact of modes of transportation.
3. Determine cost control mechanisms.
4. Determine area for performance improvement.
5. Determine the basis for a transaction analysis.

D. Traffic Management ..... 5 Hours

Outcome: Describe traffic management.

1. Describe transportation networks and traffic patterns.
2. Describe the function of expediting shipments.
3. Identify documentation and legislation associated with traffic management.

E. Import Considerations ..... 5 Hours

Outcome: Examine the import process.

1. Outline import regulations.
2. Identify import documentation.
3. Determine considerations when importing goods into Canada.

F. Export Considerations ..... 5 Hours

Outcome: Examine the export process.

1. Outline export regulations.
2. Identify export documentation.
3. Determine considerations when exporting goods from Canada.

G. Transportation and Traffic Strategies ..... 5 Hours

Outcome: Determine transportation and traffic strategies.

1. Determine factors critical to the development of a strategy.
2. Develop transportation and traffic strategies.
3. Outline claims prevention strategies.

SECTION THREE: ..... MATERIAL IDENTIFICATON AND TOOL CRIBS ..... 60 HOURS

A. Material Identification Technology ..... 5 Hours

Outcome: Describe material identification.

1. Explain the importance and value of proper identification of materials.
2. Describe the physical methods of material identification.
3. Describe electronic methods of material identification.
4. Describe records and documentation related to materials identification and tagging.

B. Automotive Equipment (Power Train) ..... 5 Hours

Outcome: Describe automotive power train components.

1. Identify automotive power train components.
2. Identify common automotive power train replacement parts.

C. Automotive Equipment (Chassis and Body) ..... 5 Hours

Outcome: Describe automotive chassis and body components.

1. Identify automotive chassis and body components.
2. Identify common chassis and body replacement components.

D. Track Equipment ..... 5 Hours

Outcome: Describe track equipment.

1. Identify the components of track equipment.
2. Identify common replacement parts for track equipment.

E. Off Highway Equipment ..... 5 Hours

Outcome: Describe off highway equipment.

1. Identify the components of off highway equipment.
2. Identify common replacement parts for off highway equipment.

F. Tractors, Tillage Equipment, Sprayers and Spreaders ..... 5 Hours

Outcome: Describe agriculture equipment.

1. Identify the components of agriculture tractors.
2. Identify the components of tillage equipment.
3. Identify the components of sprayers.
4. Identify the components of manure spreaders.
5. Identify common replacement parts for agriculture equipment.

G. Forage and Harvesting Equipment Components ..... 5 Hours

Outcome: Describe forage and harvesting equipment components.

1. Identify the components of forage equipment.
2. Identify components of harvesting equipment.
3. Identify common replacement parts for forage and harvesting equipment.

H. Oil and Gas Drilling Equipment ..... 5 Hours

Outcome: Describe materials and equipment used in the oil and gas industry.

1. Identify materials used in oil and gas drilling.
2. Identify equipment used in oil and gas drilling.

I. Oil and Gas Piping Components ..... 5 Hours

Outcome: Describe components of oil and gas piping.

1. Identify valves used in the oil and gas industry.
2. Identify pipe used in the oil and gas industry.
3. Identify fittings used in the oil and gas industry.

J. Forestry Equipment ..... 5 Hours

Outcome: Describe forestry equipment and replacement components.

1. Identify the components of forestry equipment.
2. Identify common replacement parts for forestry equipment.

K. Tool Cribs ..... 5 Hours

Outcome: Describe the purpose and operation of a tool crib.

1. Describe the purpose of a tool crib.
2. Identify tools and products controlled by tool crib staff.

L. Tool Crib Management ..... 5 Hours

Outcome: Describe the management of a tool crib.

1. Describe the operation of a tool crib, including tracking and repair of tools.
2. Describe the management of a tool crib.
3. Describe regulations and legislation associated with goods requiring recertification.

SECTION FOUR: .....LEADERSHIP..... 25 HOURS

A. Introduction to Leadership ..... 5 Hours

Outcome: Describe leadership in business environments.

1. Identify the role of leaders.
2. Identify the attributes of leaders.
3. Identify styles of leadership.
4. Describe the application of leadership.

B. Relationship Strategies ..... 5 Hours

Outcome: Examine relationship skills.

1. Identify the importance of relationships.
2. Examine the factors that affect relationships.
3. Examine the strategies to maintain relationships.
4. Examine the strategies to develop relationships.

C. Leadership Cognitive Processes ..... 5 Hours

Outcome: Describe critical thinking concepts.

1. Identify problem solving skills.
2. Explain strategic thinking processes.
3. Explain decision making processes.
4. Discuss strategies for dealing with change.

D. Task Organizational Tools ..... 5 Hours

Outcome: Examine the tools for organizing tasks.

1. Describe the use of standard operating procedures (SOP).
2. Describe the use of scenario exploration tools.
3. Describe the use of decision mapping tools.
4. Explain the value of a checklist.
5. Describe project management tools.

E. Leadership Techniques ..... 5 Hours

Outcome: Demonstrate leadership techniques.

1. Describe leadership techniques.
2. Describe motivational techniques.
3. Determine techniques based on leadership styles.
4. Determine techniques based on situations.
5. Determine techniques based on environments.

THIRD PERIOD TECHNICAL TRAINING
PARTS TECHNICIAN TRADE
COURSE OUTLINE

UPON SUCCESSFUL COMPLETION OF THIS PROGRAM THE APPRENTICE SHOULD BE ABLE TO PERFORM THE FOLLOWING OUTCOMES AND OBJECTIVES.

SECTION ONE:.....INVENTORY ..... 58 HOURS

A. Inventory Basics ..... 6 Hours

Outcome: Explain the basic concepts of inventory.

1. Identify types of inventory.
2. Describe the functions of inventory.
3. Describe inventory-related terminology.

B. Inventory Classifications ..... 6 Hours

Outcome: Explain inventory classifications.

1. Describe the life cycle of product.
2. Describe inventory classifications.
3. Describe inventory obsolescence.

C. Inventory Costs ..... 7 Hours

Outcome: Calculate costs related to maintaining stock.

1. Describe the costs of carrying an inventory.
2. Identify costs associated with inventory.
3. Explain the costs associated with obsolete inventory.

D. Inventory Turnover ..... 6 Hours

Outcome: Evaluate inventory turnover rates.

1. Describe inventory turnover rates.
2. Evaluate gross turnover rates.
3. Evaluate true turnover rates.
4. Evaluate working turnover rates.
5. Evaluate individual stock keeping unit (SKU) turnover rates.

E. Inventory Considerations ..... 7 Hours

Outcome: Evaluate inventory considerations in order to manage inventory.

1. Evaluate level of service percentage.
2. Calculate projected inventory levels.
3. Calculate working inventory value percentage.
4. Describe methods of forecasting demand.

F. Inventory Management ..... 7 Hours

Outcome: Manage inventory.

1. Describe principles of inventory control.
2. Identify inventory management systems.
3. Measure the impact of inventory.

G. Inventory Management Strategies ..... 7 Hours

Outcome: Evaluate inventory strategies.

1. Describe inventory strategies.
2. Identify factors affecting inventory strategies.
3. Evaluate inventory strategies.

H. Methods of Managing Inventory Stocking Levels ..... 6 Hours

Outcome: Describe inventory replenishment methods.

1. Describe safety stock inventory management methods.
2. Describe stocking level methods and determine reorder point.
3. Describe the economic order quantity (EOQ).
4. Describe fixed quantity method of inventory management.
5. Describe the Just-In-Time inventory management.

I. Inventory Verification ..... 6 Hours

Outcome: Describe methods of inventory verification.

1. Describe the importance of inventory verification.
2. Describe the methods of conducting inventory verification.
3. Describe organizational procedures for inventory verification.

SECTION TWO: ..... PROCUREMENT ..... 30 HOURS

A. Purchasing ..... 10 Hours

Outcome: Explain the purchasing process.

1. Describe purchasing related terminology.
2. Describe types of orders.
3. Describe types of purchasing.
4. Identify types of purchasing documentation.
5. Identify types of purchasing systems.

B. Ethical And Legal Principles ..... 5 Hours

Outcome: Describe ethical and legal principles of purchasing.

1. Describe the legal and ethical guidelines that govern purchasing.
2. Identify the elements of a legal contract.

3. Discuss the obligations that both the purchaser and the vendor have when entering into a transaction.

C. Purchase Analysis, Decision Making And Negotiation ..... 5 Hours

Outcome: Explain purchase analysis, decision making and negotiation techniques.

1. Describe the operations included in purchasing material or services.
2. Describe purchasing cost analyses.
3. Describe lead-time and how it affects purchasing.
4. Describe negotiation techniques.

D. Pricing ..... 10 Hours

Outcome: Exhibit pricing mathematical skills.

1. Interpret price structures and price lists.
2. Discuss methods of charging out consumables.
3. Describe the purpose of mark-ups and discounts.
4. Calculate mark-ups on cost price (cost, consecutive and constant multipliers).
5. Calculate mark-ups on selling price.
6. Calculate mark-downs (discounts, consecutive and constant multipliers).
7. Calculate gross profit and gross profit margin.

SECTION THREE: ..... DESIGN AND PLANNING ..... 40 HOURS

A. Planning and Design ..... 14 Hours

Outcome: Design a storage facility.

1. Outline the application of legislative and other requirements as they apply to space design.
2. Discuss market needs and how they impact design.
3. Discuss infrastructure for design.

B. Parts Outlet Design ..... 13 Hours

Outcome: Design a parts outlet.

1. Assess traffic flow and space requirements.
2. Identify storage systems.

C. Warehouse Design ..... 13 Hours

Outcome: Design a warehouse.

1. Assess traffic flow and space requirements.
2. Identify storage systems.

SECTION FOUR: ..... BUSINESS MANAGEMENT ..... 28 HOURS

A. Strategic and Operational Planning ..... 5 Hours

Outcome: Describe strategic and operational planning processes.

1. Describe business terminology.
2. Discuss importance of strategic planning.
3. Discuss importance of operational planning.
4. Describe rationale for setting goals and performance measures.

B. Financial Planning Strategies ..... 5 Hours

Outcome: Describe financial planning strategies and assessment tools.

1. Explain the purpose of financial planning.
2. Explain the function of budgeting.

C. Financial Planning Assessment Tools ..... 5 Hours

Outcome: Describe financial assessment tools.

1. Calculate gross margin return on investment.
2. Calculate breakeven point.
3. Calculate payback period.
4. Calculate the true cost of stolen, lost or damaged product.

D. Financial Planning Measurements ..... 10 Hours

Outcome: Describe financial measurements.

1. Calculate depreciation.
2. Perform a cost/benefit analysis.
3. Calculate return on investment.
4. Explain asset management.
5. Calculate financial measurements.

E. Quality Management ..... 3 Hours

Outcome: Outline quality management principles.

1. Identify types of quality management strategies.
2. Explain how quality management practices contribute to operations.

SECTION FIVE: ..... HUMAN RELATIONS AND ADVISORY NETWORK ..... 24 HOURS

A. Human Resource Management ..... 6 Hours

Outcome: Describe human resource management.

1. Review employee-related legislation.
2. Describe human resources related documents and record retention.

3. Describe employee recruitment processes.

B. Human Resource Strategies ..... 6 Hours

Outcome: Describe human resource management issues.

1. Describe employee retention strategies.
2. Describe employee development strategies.
3. Describe employment corrective processes.

C. Workplace Coaching Skills ..... 4 Hours

Outcome: Display coaching skills.

1. Describe coaching skills used for training apprentices.

D. Alberta's Industry Network ..... 2 Hours

Outcome: Describe the role of the Alberta Apprenticeship and Industry Training Board and the network of industry committees that represent the trades and occupations in Alberta.

1. Describe Alberta's apprenticeship and industry training system.
2. Describe the roles and responsibilities of the Alberta Apprenticeship and Industry Training Board, government and post-secondary institutions.
3. Describe the roles and responsibilities of the PACs, LACs and occupational committees.

E. Interprovincial Standards Red Seal Program ..... 6 Hours

Outcome: Use Red Seal products to challenge an Interprovincial examination.

1. Identify Red Seal products used to develop Interprovincial examinations.
2. Use Red Seal products to prepare for an Interprovincial examination.

Apprenticeship and Industry Training

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